tunately were shaded by cirrus clouds until after the mercury froze in their thermometers. The highest elevation at which a radiation record was obtained was about 14,000 meters, or nearly 45,000 feet. As stated in last year's report, no results indicating that values of radiation exceeding our solar constant value (1.93 calories) are obtainable by pyrheliometric measurements at any elevation, however high, appear from these balloon pyrheliometer experiments. In view of the proposed repetition of the experiments with improved apparatus no further statement of these preliminary results is necessary here.

*The tower-telescope work.*—As stated in former reports, investigations were carried on at Washington during the years 1904–1907 to determine the distribution of the sun's radiation along the diameter of the solar disk. It was shown by this work, in accord with results of earlier observers, that the edge of the solar disk is much less bright than the center, and that this contrast of brightness is very great for violet and ultraviolet rays, but diminishes steadily with increasing wave lengths and becomes very slight for red and especially for infra-red rays. * * *

The measurements were continued at Washington on all suitable days in the hope that some fluctuation of this contrast of brightness between the edge and center of the solar disk would be disclosed. It seemed probable that there might be such fluctuations associated with the irregular variability of the total solar radiation. It proved, however, that such fluctuations, if existing, were of so small an order of magnitude that it was not certain whether they were really shown by the observations at Washington, hampered as these were by variable transparency of the air.

When the observing station was erected on Mount Wilson in 1908, provision was made for a tower telescope designed to continue this research. When in 1911 and 1912 the Algerian expeditions confirmed the sun's variability, added interest was felt in the proposed experiments. Accordingly, the tower, 50 feet in height, was completed in 1912. Not sufficient funds were available to equip the tower telescope, but Director Hale, of the Mount Wilson Solar Observatory, kindly loaned considerable apparatus, and with this and some apparatus which remained from eclipse expeditions, and by using anything available, as, for instance, a trunk of a tree for a mirror support at the top of the tower, Messrs. Abbot and Aldrich succeeded in getting arranged on the tower a reflecting telescope of 12 inches aperture and 75 feet focus, all ready for observations by September 9, 1913. Then and thereafter solar constant measurements were supplemented by determinations of the distribution of radiation along the sun's diameter on each day of observation. These determinations are made in seven different wave lengths on each day, ranging from 0.38$\mu$ in the ultraviolet to 1.1$\mu$ in the infra-red. Fortunately, the definition of the tower telescope proves to be very good. There is slight change of focus during the several hours of observing, and the "seeing" seems not to deteriorate much up to 10 a. m., at which time the observations are generally concluded.

About 45 days of simultaneous observations of the "solar constant" and of the distribution of radiation over the sun's disk were secured in 1913. The results appear to indicate a variability in both phenomena and a distinct correlation of the two in point of time. It is indicated that when in course of its short-period irregular variation the solar radiation increases, there occurs simultaneously a diminution of the contrast between the edge and center of the sun's disk. A change of brightness of about 1.5 per cent was found to occur at 95 per cent out on the solar radius accompanying a change of 6 per cent in the solar radiation. On comparing the mean of all results obtained in 1913 with the mean of all obtained in Washington in 1906–7, it appears that there was distinctly less contrast of brightness between the edge and center of the sun's disk in 1913 than in 1907. We have reason, however, to believe that there was distinctly a greater total solar radiation in 1907 than in 1913. This result, compared with the result stated above, indicates a difference of character between the long-period fluctuations of the sun and its short-period irregular fluctuations. The changes of contrast found, however, agree in this, that whether from day to day in 1913, or as between 1913 and 1907, the violet or shorter wave-lengths change in contrast more than the red or longer wave lengths. * * *

## THE AMERICAN METEOR SOCIETY.

By Prof. CHARLES P. OLIVIER.

[Dated: Charlottesville, Va., December 25, 1914.]

The American Meteor Society was first organized in the latter part of 1911, and from that time to the present has endeavored to stimulate interest in this much neglected branch of astronomy.

As must necessarily be the case, most of its members are amateurs, but there are several professional astronomers also enrolled. At the present time it contains about 20 members, the larger part being also members of the Society for Practical Astronomy, whose "Meteor section" forms far the most active group of our workers.

The purpose of the organization is to stimulate interest in observing and recording meteors along carefully planned and uniform lines, to collect this data at a central office, and to have the results computed and published in scientific form.

Circulars are furnished describing our methods and blank forms for the records are sent free on application. Also prospective members are advised where to secure suitable maps and anything else they may desire. All persons interested in this subject are urged to join us and are assured that they will receive full credit for any work submitted. The results from 1911 to 1913, inclusive, have been carefully worked up and printed as volume 2, part 4, of the publications of the Leander McCormick Observatory of the University of Virginia. In all, 126 parabolic orbits of meteor streams and many other results of interest were obtained from the 2,800 meteors there discussed. We would be very glad to secure any unpublished meteor records of any year whatever and to undertake their discussion and reduction. All communications and inquiries are to be addressed to Charles P. Olivier, Leander McCormick Observatory, University of Virginia. As scientific work in Europe is at present so greatly hindered, it is especially hoped that American observers will do more than their share during 1915 in observations of meteors.

[See also the MONTHLY WEATHER REVIEW, January, 1913, 41: 162.]